

Operating Micro Hydro Plants as Commercially Viable Enterprises

Mini-Grid Sustainability:

Transitioning to Social Enterprise for Energy and Economic Development

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Scenarios of existing MHPs in Nepal

- Social asset rather than a profit making enterprise
- 2/3^{rds} of MHPs operate with some difficulties due to ineffective management
 - Very low utilization of electricity (~ 20%),
 - No marketing strategy to increase sales of electricity
 - High rest time (~8-10 hrs. per day) means frequent and long outages are quite common
 - No office setup and incentive facilities
- Weak cash flow performance:
 - Unrealistic tariff rates
 - Irregular revenue collection
 - Insufficient investment in proper O&M and staffing

About the project

- Title: Sharing Learning Across Projects: Operating Micro Hydro Plants as Commercially Viable Enterprises
- Jointly implemented by Winrock International and AEPC/RERL
- Funding: WISIONS and AEPC/RERL
- Project area: 4 MHPs in Baglung District and 1 MHP in Gulmi District



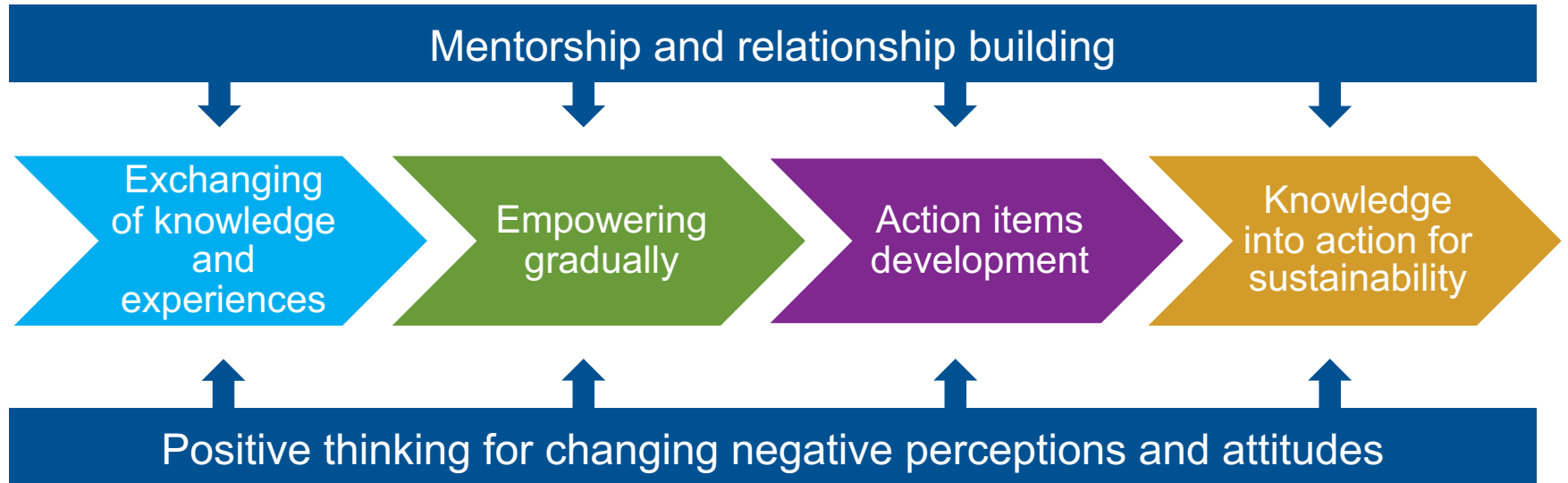
Government of Nepal
Ministry of Energy, Water Resources and Irrigation
Alternative Energy Promotion Centre



Selection criteria for MHPs

- Technically sound but managerially and financially weak MHPs with capacity > 60kW
- Cluster/corridor
- Potential for productive end uses
- > 3 years of post-installation
- Willingness of stakeholders to participate (i.e. Chairpersons of rural municipalities, Ward chairpersons, MHP chairpersons and management committee members, manager, facility operators, etc.)

Approach



1. Technical management
2. Financial management
3. Degree of ownership
4. Management committee leadership
5. Human resource management

6. Procurement system
7. Customer service
8. Marketing and sales management
9. Demand side management
10. Post construction services

[illegible]



Knowledge into Actions

Governance

Knowledge into action

- Improved confidence to run MHP as profitable enterprise
- Change in management model and registered with government
- Increased transparency (more public meetings)
- Raised awareness among beneficiaries (door to door visits)
- Improved management committee ownership (active participation, effective decision making and regular follow ups and monitoring)

निसीखोला दोस्रो तपुजलविद्युत आयोजना

निसीखोला - ४ योगी धुम्का बागलुङ

स्था : २०६४

दोस्रो साधारण सभा तथा अधिवेशन बाट निर्वाचित पदाधिकारीहरू - २०७४

नाम	ठेगाना	पद	फोन
१. लोकेश्वर पौडेल	निसीखोला गाउँपालिका - ४	अध्यक्ष	९८४७६२२४४७९८०६१९७५४७
२. रेशम बि.क.	निसीखोला गाउँपालिका - ३	उपाध्यक्ष	९८२३४९०५१८
३. डालेन्द्र हमाल(मिलन)	निसीखोला गाउँपालिका - ४	सचिव	९८६७९४७७९७९८०५२२७४०७
४. हुमकला पुन चन्द	निसीखोला गाउँपालिका - ४	कोषाध्यक्ष	९८२१३१८८७२
५. भिम प्रसाद रेग्मी	निसीखोला गाउँपालिका - ४	सह-सचिव	९८०६१७२०२०
६. चक्र ब. कुवर	निसीखोला गाउँपालिका - ३	सदस्य	९८०५२३०९४२
७. खिम ब. खड्का	निसीखोला गाउँपालिका - ३	सदस्य	९८६६०२८३८९
८. रिम प्रसाद भुसाल	निसीखोला गाउँपालिका - ३	सदस्य	९८०५१९३९५२
९. भिविन्द्र आचार्य	निसीखोला गाउँपालिका - ४	सदस्य	९८०६११८५२५
१०. बलिराम भुसाल	निसीखोला गाउँपालिका - ५	सदस्य	९८१९४८८२१२
११. भानिेश्वर कडेल	निसीखोला गाउँपालिका - ५	सदस्य	९८०८०७७२२३
१२. रमेश विक्रम शाही	निसीखोला गाउँपालिका - ४	सदस्य	९८०५२८५५३०
१३. जिवनाथ गौतम	निसीखोला गाउँपालिका - ४	सदस्य	९८१३११११९२
१४. भुमिराज रेग्मी	निसीखोला गाउँपालिका - ४	सदस्य	९८११९३३०८१
१५. अम कुमारी रेग्मी	निसीखोला गाउँपालिका - ४	सदस्य	९८१५४३८६१३
१६. रन कुमारी शाही	निसीखोला गाउँपालिका - ३	सदस्य	
१७. जमुना गिरी	निसीखोला गाउँपालिका - ४	सदस्य	९८०५२७९१००
१८. एलिना खत्री	निसीखोला गाउँपालिका - ३	सदस्य	
१९. टिकानिधी पौडेल (पदेन सदस्य)	निसीखोला गाउँपालिका - ४	सदस्य	९८४६८१२९७३ ९८०८६२४९०७

१) सल्लाहकार संयोजक : खिम विक्रम शाही निसीखोला गाउँपालिका, ४ बागलुङ
 २) सल्लाहकार सदस्य : टंक प्रसाद पौडेल निसीखोला गाउँपालिका, ४ बागलुङ
 ३) सल्लाहकार सदस्य : दिलीपराज आचार्य निसीखोला गाउँपालिका, ४ बागलुङ
 ४) सल्लाहकार सदस्य : छोट ब. शाही निसीखोला गाउँपालिका, ३ बागलुङ
 ५) सल्लाहकार सदस्य : मानसिंह घर्ति निसीखोला गाउँपालिका, ३ बागलुङ



Office management

Knowledge into action

- Selection of qualified managers
- Managers given more responsibility
- Establishment of office in central location with easy commute
- Office supplied with sufficient furniture and other logistic materials (e.g. notice boards, wall paints, hoarding boards, complaint box, help desk, revenue collection counter(s), visitors' notebook, etc.)
- Improved file organization and proper management of documents
- Established Operational Guidelines/Rules/Regulation and other documents as needed



Technical management

Knowledge into action

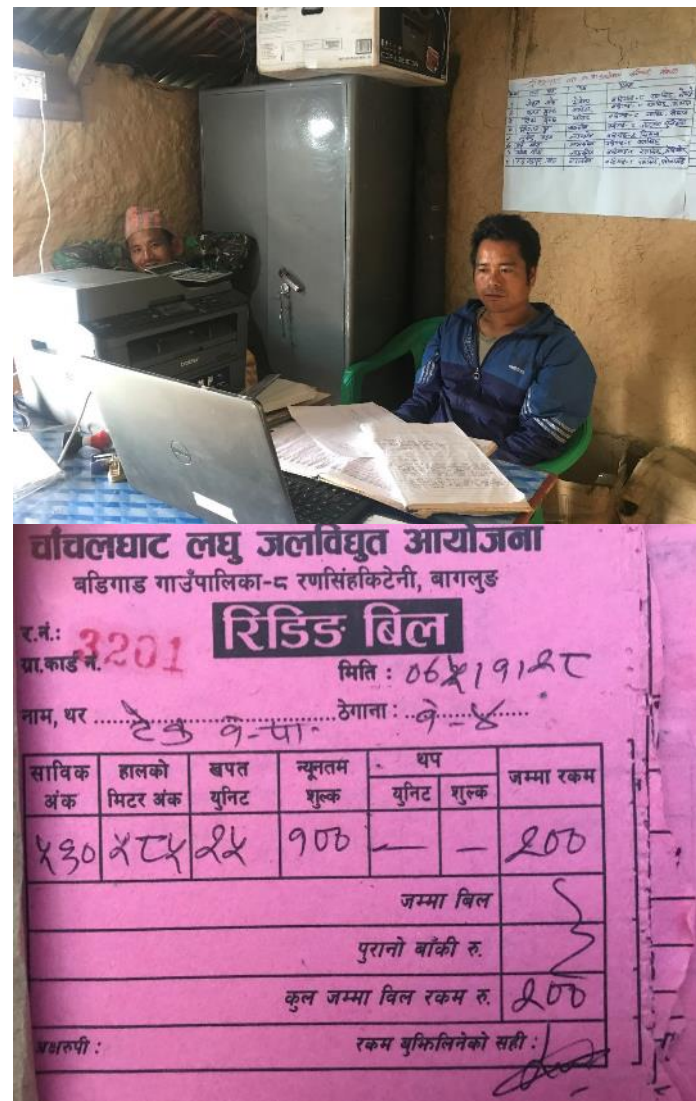


- Operation hours increased to 22-23 hrs./day, fixed shut down time, shut down time at off peak hours
- Installed household energy meter and replaced damaged meters
- Scheduled metering reading for a specific time and task assigned to specific staff member
- Regularly scheduled maintenances and R&M tools and stock of spare parts kept on site
- Demand Side Management
- Promotion of PEUs for MHP
- Use of energy efficient technology (CFL or LED bulbs, electric cookers/stovetops, etc.)

Financial management

Knowledge into action

- Scheduled tariff collection system: Specific time, place and staffs for tariff collection.
- Targeted the collection of outstanding tariff with door to door visits and a penalty system
- Adopted good practices from other MHPs (e.g. shift away from paper filing to a computer-based account management system)
- Improved financial transparency with regular meetings, sharing information, performing financial transaction through financial institutions, public audit, and public hearings
- Improved procurement system with the establishment of Procurement Guidelines, including requirements like seeking quotes from different suppliers



Human resource management

Knowledge into action

- Clear roles and responsibilities were established with staff
- Regular staff meetings and follow up on assigned tasks
- Regular and timely employee payment
- Improved staff facilities
- Introduced more output -based financial incentives



Marketing and sales management

- **Finding new sources of revenue:** Nisi Kholā II MHP is selling sand collected in desilting basin and water from canal to IWM and Chachalghat MHP is investing its fund to its members at interest rate of 24%.
- **Building relationships with existing and potential customers:** interaction, FM, awareness at school, door to door marketing, connection charge reduced to serve poor households, payment in installment systems, MCB upgradation, street lights, etc.
- **Improving customer service:** Timely information, try to address complain within 24 hours, suggestion box, etc.

Project results

- **Electricity sales increased by 10% - 15% due to:**
 - Increase in number of customers
 - Increase in electricity use by existing customers
 - Longer hours of operation
- **Monthly revenue from electricity sales has been increasing by 10% - 40%.**
 - Customers are accepting that they have to pay for a reliable electricity supply
 - Increase of revenue of the MHP not only depends upon electricity use but depends upon smart tariff system and proper tariff collection system

Project results

- Outstanding (Past-due) money is being collected
- Monthly revenue collected is higher than monthly expenses.
 - Timely salary payment has improved staff's motivation
 - In-house O&M means they are able to carryout minor repair and maintenance and office improvement with their own funds
 - On-time loan payment and loan amount reduced
 - Better relationship with financial institution
- Ownership has improved.
- Reliable electricity supply for households, institutions and enterprises.

Challenges



Some MHPs are fast adopters and some are slow

Political interference can hinder the selection of the candidate most qualified for MHP

Improvement is a continuous process and it takes some time

Natural disasters are a constant risk in the project area

Conclusion and recommendation

- Managerially poor and financially weak MHP can be transformed into a profitable enterprise.
- The focus needs to be shifted from the number of customers to the number of customers *with access to reliable electricity supply*.
- Empowering MHP management committee members, staff, and municipality representative is important for improving the overall performance of MHP.
- Promoting the exchange of knowledge and experiences between practitioners as well as establishing mentorships improve learning.
- There are many MHPs in Nepal that are still in need of similar support.
- Establish a knowledge management to for the MHP management committee members at the beginning (project preparation, before the construction phase).

Resources

- <https://www.youtube.com/watch?v=nNgD2c0ze5U>
- <https://www.winrock.org/in-nepal-macro-lessons-for-micro-hydro/>
- <https://www.wisions.net/posts/micro-hydro-plants-as-commercially-viable-enterprises/page:43#post247>
- http://www.winrock.org.np/uploads/story/file/Winrock%20Success%20Story_Chachalghat_CP_final%2026%20Dec_20181226123658.pdf
- http://www.winrock.org.np/uploads/story/file/Winrock%20Success%20Story-Nishill_CP_final_26%20dec_20181226123525.pdf



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